

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

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| Applicant's or agent's file reference PHNL031056WO | FOR FURTHER ACTION | See item 4 below |
| International application No. PCT/IB2004/051554 | International filing date (<i>day/month/year</i>) 24 August 2004 (24.08.2004) | Priority date (<i>day/month/year</i>) 03 September 2003 (03.09.2003) |
| International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237 | | |
| Applicant KONINKIJKE PHILIPS ELECTRONICS N.V. | | |

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 *bis*.1(a).
2. This REPORT consists of a total of 7 sheets, including this cover sheet.

In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

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| <input checked="" type="checkbox"/> Box No. I | Basis of the report |
| <input checked="" type="checkbox"/> Box No. II | Priority |
| <input type="checkbox"/> Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| <input type="checkbox"/> Box No. IV | Lack of unity of invention |
| <input checked="" type="checkbox"/> Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/> Box No. VI | Certain documents cited |
| <input type="checkbox"/> Box No. VII | Certain defects in the international application |
| <input type="checkbox"/> Box No. VIII | Certain observations on the international application |
4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).

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|---|---|
| The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 740 14 35 | Date of issuance of this report 06 March 2006 (06.03.2006) Authorized officer <div style="text-align: center; font-weight: bold;">Idhir Britel</div> Telephone No. +41 22 338 70 60 |
|---|---|

PATENT COOPERATION TREATY

REC'D 23 NOV 2004

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From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing

(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/IB2004/051554

International filing date (day/month/year)
24.08.2004

Priority date (day/month/year)
03.09.2003

International Patent Classification (IPC) or both national classification and IPC
H04B7/08, H04L1/06

Applicant
KONINKIJKE PHILIPS ELECTRONICS N.V.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/IB2004/051554

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ in written format
 - ☐ in computer readable form
 - c. time of filing/furnishing:
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in computer readable form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/IB2004/051554

Box No. II Priority

1. ☒ The following document has not been furnished:

☒ copy of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(a)).

☐ translation of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(b)).

Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.

3. Additional observations, if necessary:

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

| | | |
|-------------------------------|-------------|---------------|
| Novelty (N) | Yes: Claims | 2,4,6-9,11-16 |
| | No: Claims | 1,3,5,10,17 |
| Inventive step (IS) | Yes: Claims | 4,14-16 |
| | No: Claims | 1-3,5-13,17 |
| Industrial applicability (IA) | Yes: Claims | 1-17 |
| | No: Claims | NONE |

2. Citations and explanations

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following documents:

- D1: EP-A-0 851 605 (MATSUSHITA ELECTRIC IND CO LTD) 1 July 1998 (1998-07-01)
D2: EP-A-0 767 554 (BECKER GMBH) 9 April 1997 (1997-04-09)
D3: OKADA M ET AL: "ARRAY ANTENNA ASSISTED ADAPTIVE MODULATION IN A FAST FADING CHANNEL" VTC 2001 SPRING. IEEE VTS 53RD. VEHICULAR TECHNOLOGY CONFERENCE. RHODES, GREECE, MAY 6 - 9, 2001, IEEE VEHICULAR TECHNOLOGY CONFERENCE, NEW YORK, NY : IEEE, US, vol. VOL. 2 OF 4. CONF. 53, 6 May 2001 (2001-05-06), pages 1249-1253, ISBN: 0-7803-6728-6

1. The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 1 and 17 is not new in the sense of Article 33(2) PCT.

- 1.1 Claim 1:

The document D1 discloses (the references in parentheses applying to this document) a diversity receiver comprising a first receiving branch (figure 1/ref. signs 3, 5, 7) having associated thereto a first antenna element (figure 1/ref. sign 1) and at least a second receiving branch (figure 1/ref. signs 4, 6, 8) having associated thereto a second antenna element (figure 1/ref. sign 2), the diversity receiver comprising first means (figure 1/ref. signs 9, 11) for obtaining from a first signal on the first receiving branch and a second signal on the second receiving branch a third signal representing an estimation of the spatial derivative of at least one receiving channel parameter, wherein the third signal is used to cancel or at least reduce signal distortions that occur due to time-variations of the receiving channel (page 5, lines 48, 49).

Even if D1 does not disclose the difference signal at the output of summer 11 in figure 1 to represent an estimation of the spatial derivative of the receiving channel, this difference signal nevertheless represents an estimation of the spatial derivative of the receiving channel (see claim 3 of the present application).

1.2 Claim 17:

The document D2 discloses (the references in parentheses applying to this document) an antenna system for receiving a radio signal at at least two closely spaced positions differing in the direction of motion, wherein the antenna system comprises at least a first antenna element and a second antenna element arranged such that the mutual interaction of the radio patterns is small (column 1, lines 3-21).

2. Dependent claims 2,3, 5-13 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and inventive step, see documents D1, D2 and D3 and the corresponding passages cited in the search report.

3. Claims 14-16:

- 3.1 The document D1 is regarded as being the closest prior art to the subject-matter of claim 14, and shows (see point 1.1 above) a method for cancelling or at least reducing signal distortions of a radio signal received by a diversity receiver, wherein the signal distortions occur due to time-variations of a receiving channel in a radio system, said method comprising the following steps:

- receiving the radio signal at two closely spaced positions;
- estimating the spatial derivative of at least one receiving channel parameter on the basis of the radio signal received at the two positions.

- 3.2 The subject-matter of claim 14 differs from this known method in that

- the receiver is moving;
- the two closely spaced positions differ in the direction of motion;
- the spatial derivative of the at least one receiving channel parameter is interpreted as the temporal derivative of the at least one receiving channel parameter; and
- the temporal derivative of the at least one receiving channel parameter is exploited to cancel or at least reduce the signal distortions.

The subject-matter of claim 14 is therefore new (Article 33(2) PCT).

- 3.3 The problem to be solved by the present invention may be regarded as how to reduce signal distortions due to rapid channel variations.

- 3.4 The solution to this problem proposed in claim 14 of the present application is

considered as involving an inventive step (Article 33(3) PCT) because no available prior art document discloses or hints at all the missing features as stated under point 3.2 or renders them obvious.

- 3.5 The same reasoning applies, *mutatis mutandis*, to the subject-matter of the corresponding independent claim 16 and the dependent claim 4, which therefore are also considered new and inventive.
- 3.6 Claim 15 is dependent on claim 14 and as such also meets the requirements of the PCT with respect to novelty and inventive step.